ILLINOIS WATERWAY, PEORIA LOCK AND DAM
1071 Wesley Road
Creve Coeur vicinity
Tazewell
Illinois

HAER IL-164-B
IL-164-B

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

ILLINOIS WATERWAY, PEORIA LOCK AND DAM

HAER NO. IL-164-B

Location:	1071 Wesley Road, Creve Coeur vicinity, Tazewell County, Illinois, on Illinois River Latitude: 40.6309536, Longitude: -89.6243589
Present Owner:	U.S. Army Corps of Engineers, Rock Island District
Present Use:	Navigation of Illinois Waterway
Significance:	The Peoria Lock and Dam site is significant as a component of the Illinois Waterway, which provided a navigable route from Lake Michigan to the Mississippi River and beyond. Peoria Dam is also significant as one of the few surviving examples of a dam with Chanoine wicket gates in this country.
Historian:	Justine Christianson, HAER, 2008
Project Information:	The Illinois Waterway Recording Project (2007-2008) is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER is administered by the Heritage Documentation Programs, a division of the National Park Service, U.S. Department of the Interior, Richard O'Connor, Manager. The U.S. Army Corps of Engineers (USACE) funded the project. Ron Deiss, USACE, and Dana Lockett, HAER Architect, served as project managers. Dana Lockett and Anne Kidd produced the measured drawings. Large format photography was done by Brian Grogan. Justine Christianson wrote the historical reports. Research assistance was provided by John Fitzgerald, Archivist, USACE.

Part I. Historical Information

A. Physical History:

1. **Date of Construction:** (1935-1939)
The dam, lock, and control station were designed and built from 1935-1939, when the site went into operation. Maneuver Boat No. 2 was also in operation by 1939.[1]

2. **Architect/Engineer:**
A.F. Griffin of the Army Corps designed the dam. He designed the lock with Walter B. Farrar, also of the Army Corps. Paul Le Gromwell of the Army Corps designed the control station, which is identical to the one at La Grange (see HAER No. IL-164-A).[2]

3. **Builder/Contractor/Supplier:**
Great Lakes Dredge & Dock Company and Warner Brothers Construction built the lock.[3] The C. A. Hooper Company was awarded the contract to build the control station.[4]

The Calumet Shipyard & Dry Dock Company of South Chicago built Maneuver Boat No. 2 and delivered it to the site on October 24, 1938.[5]

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[1] Mary Yeater Rathburn and American Resources Group, Ltd., "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange," Volume 2, prepared for U.S. Army Corps of Engineers, Rock Island District, Rock Island, IL, October 1996, pp. 445-451

[2] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 445-449.

[3] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 447.

[4] The control station was constructed under Contract W-1088-Eng-1018. C.A. Hooper Company subcontracted the manufacture of various components of the control station. Structural steel and other steel components were purchased from Joseph T. Ryerson and Son, Inc., while steel sash and various types of nuts, bolts and washers were supplied by Ceco Steel Products Corporation. The roof slabs, cover plates and other miscellaneous items came from Precast Slab and Tile Company, while cast stone was purchased from Rock Hill Precast Concrete Corporation. Manning Maxwell & Moore Inc. of Bridgeport, Connecticut manufactured the pressure gauges. Graybar Electric Company was in charge of all electric work. Some of the electrical components, including various types of cables and signals, were manufactured by National Electric Productions Corporation of Anbridge, Pennsylvania. L. A. Millbrook, Co. ("Manufacturer of High Tension Electrical Specialties Testing & Control Equipment") supplied the junction boxes and cable terminals. The Crane Company of Milwaukee, Wisconsin, supplied a 4" Special No. 169-X Cast Steel Check Valve. The switchboard, oil and air pressure regulators, fuel oil pump controller, and fuses were manufactured by Cutler-Hammer, Inc. of Milwaukee. The standby unit, engine #18045, generator #96341, generator engine, switchboard, regulating valves, and hydrometer came from Climax Engineering Co. of Clinton, Iowa. Clyde Iron Works of Duluth, Minnesota, supplied the two electric tow haulage units. Gasoline supply, cooling and priming tanks were purchased from the John Petersen Manufacturing Company. A hydro-pneumatic accumulator tank came from Babcock & Wilcox Co. The Worthington Pump and Machinery Corporation of Harrison, New Jersey supplied Worthington Vertical Triplex Single Acting Plunger Power Pumps and General Electric motors. See Folder 821.1 "Peoria L&D, W-1088-Eng-1018, Inspection, Control House, 1938," in Army Corps of Engineers, Chicago District Records, Record Group 77, National Archives and Records Administration, Great Lakes Region-Chicago (hereafter cited as RG 77, NARA, Chicago).

[5] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 451.

4. **Original Plans:**
Drawings of the control station dating to June 1934 reveal its original fenestration. The symmetrical front and rear facades were divided into five bays by six brick pilasters with cast stone caps. Each bay had steel sash windows on the first and second floors, with those on the ends being slightly narrower than the center three bays. The second story windows located on the ends had fifteen lights while the three in the center had twenty-five lights. Each of the second story windows had a fanlight. The first story windows flanking the door had fifteen lights, while the two on the ends had nine lights. A door with a staircase provided access to the second story on the downstream end of the building while the upstream end had a chimney.[6]

5. **Alterations and Additions:**
The Peoria site underwent a rehabilitation from 1986-88 that included resurfacing portions of the lock walls. A Tainter gate was installed in place of twenty-six of the landward wickets.[7]

In 1990, the control house underwent a rehabilitation that involved replacing the second story windows, removing the first story windows and filling in the openings, replacing the roof, and restoring the exterior masonry.[8]

B. Historical Context:
The 1935 Rivers and Harbors Act included a recommendation that due to an upcoming Supreme Court-mandated decrease in the allowable amount of water diversion from Lake Michigan, the original locks and dams at La Grange and Kampsville should be removed and new ones built at Peoria and La Grange. The act followed the December 6, 1933 recommendation by the Chief of Engineers, in which he stated in order "to provide a fully useful commercial waterway," the channel should be altered to 9' deep and 300' wide below Lockport and that "modern" locks and dams be built at Peoria and La Grange.[9] After Congress granted its approval, A.F. Griffin of the Army Corps' Chicago District developed a new lock and dam design to be built at Peoria and La Grange.[10] The plans called for construction of an Ohio River Standard Navigation lock, a dam with wicket gates and an International Style control station (designed by Paul Le Gromwell also of the Chicago District). Historian Mary Yeater Rathburn

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[6] U.S. Division Engineer Office, Upper Mississippi Valley Division, St. Louis, Missouri, "Illinois River, Peoria Lock & Dam Control Station, Elevations & Typical Wall Section," June 1936.
[7] Mary Yeater Rathburn and American Resources Group, Ltd., "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange," Volume 1, prepared for U.S. Army Corps of Engineers, Rock Island District, Rock Island, IL, October 1996, p. 92 and Volume 2, pp. 445, 447.
[8] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 449.
[9] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 91; U.S. Army Corps of Engineers, *Annual Report of the Chief of Engineers* (Washington, DC: Government Printing Office, 1934), p. 855 (hereafter cited as USACE, *Annual Report*, date of publication).
[10] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 95; USACE, *Annual Report*, 1933, p. 735.

notes that Le Gromwell was probably influenced by the 1933 Century of Progress Exposition in Chicago.[11] The dam was modeled after the nineteenth century dams at Henry, Copperas Creek, and Kampsville, which had Chanoine wickets set on a concrete sill.[12] The choice of wicket gates for the dams rather than the Tainter gates used elsewhere on the waterway can be attributed to a number of factors. The use of Chanoine wicket gates rendered the dam not just movable but also navigable when the gates were in the lowered position. Navigable dams were useful in those sites where extended periods of open river navigation were possible, such as at the lower end of the Illinois River where La Grange and Peoria were located.[13] Wicket gates were also recommended for use on large rivers where rapid flooding was a possibility because they were "not easily disabled, can be maneuvered rapidly" and did not contain a great number of "loose parts." The rapidity with which the wickets could be raised and lowered was also seen as an advantage.[14] The location of the proposed La Grange and Peoria locks and dams on the lower end of the river and waterway coupled with the area's tendency to flood regularly undoubtedly influenced Griffin to choose wicket gates for the new dams.

The plan for the Peoria site called for construction of an Ohio River Standard Navigation lock and a 1,050' long movable dam. The project also included construction of an esplanade with lock tenders' residences located on it, an approach roadway to provide access to the lock and residences, and a control station.[15] The Army Corps awarded the contract for the lock construction to the Great Lakes Dredge & Dock Company of Chicago who had submitted a bid of $1,654,592.50 to construct a "single, stripped lock," meaning that they did not provide the miter gates, valves or lock operating machinery and equipment.[16] The Neville Island Branch of the Independent Bridge Company won the contract to supply the lock gates, valves, and operating machinery in 1936. The company subcontracted to Hunter Steel Company

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[11] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 95.
[12] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 91.
[13] William Patrick O'Brien, Mary Yeater Rathburn, and Patrick O'Bannon, edited by Christine Whitacre, *Gateways to Commerce* (Denver: National Park Service, Rocky Mountain Region, 1992), p. 41. They point out that non-navigable dams, such as those found elsewhere on the waterway, were able to allow "accurate regulation of pool heights" since they had more flexibility in opening than wicket gates, which can only be fully raised or fully lowered. In addition, "the higher sills of non-navigable dams also ensured a minimum pool level." Wicket gates are costly to maintain and operate, factors that ultimately caused the Army Corps to replace the wicket gates on the Ohio River with roller and Tainter gates.
[14] B.F. Thomas and A.D. Wyatt, *The Improvement of Rivers: A Treatise on the Methods Employed for Improving Streams for Open Navigation and for Navigation by Means of Locks and Dams* (New York: John Wiley & Sons, Inc., 1905), p. 239; Edward Wegmann, *The Design and Construction of Dams Including Masonry Earth, Rock-Fill, Timber and Steel Structure. Also the Principle Types of Moving Dams* (New York, John Wiley & Sons, 1922), p. 331.
[15] Folder 821.1 (Peoria L&D) in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[16] "Final Cost Report, Peoria Lock-Illinois River Lock & Guide Walls," Under Contract No. ERW-1088-Eng-1 Cont'r: Great Lakes Dredge & Dock Co, December 1935-December 1937, U.S. Engineer Field Office, Peoria, IL, p. 2 in Folder 821.1 in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

for the operating machinery and lock gates.[17] The High Point Lumber Company of High Point, Washington was the subcontractor to the Great Lakes Dredge & Dock Company and supplied the crib timber. The Carnegie-Illinois Steel Corporation supplied the steel guidewall materials.[18]

The Army Corps noted in its 1937 *Annual Report* that contractors had been removing material at a cost of just over $763,000 and that construction was 49.79 percent.[19] Two years later, the Army Corps reported that the dredging, construction of the site's structures, and installation of sewer and water lines had been completed.[20] The lock and dam were in operation in 1939.

Part II. Structural/Design Information

A. General Description[21]

Components of the site include the dam, lock and control station, as well as auxiliary structures, including Maneuver Boat No. 2, tow haulage units, the SANGAMON, control stands, office building, field office, garage, fire house shed, welding shop, lumber shed, and building for flammable liquid storage.[22]

Stretching across the Illinois River is the 536' long concrete pier dam made up of 108 wicket gates and a Tainter gate at the lock end. A regulating weir is located at the opposite end of the dam.[23]

To the east of the dam is the Ohio River Standard Navigation lock, which has a 110' x 600' chamber with reinforced concrete walls and an 11' lift. The lock has steel miter gates at both its upstream and downstream ends that are operated by electric motor assemblies. The chamber is watered by ten rectangular ports measuring 5' x 3'-6" located along the bottom of each chamber wall. The ports extend from a 12' diameter culvert that runs through the interior of the chamber walls. The difference in size between the ports and culvert diameter was planned in accordance with the Venturi principle, which states that the pressure of water is increased by movement

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[17] Folder 821.13 (Peoria & Lock Machinery), in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago; Folder 821.1 (Peoria L&D) in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[18] "Inspection of Crib Timber, 1936-37," Folder 821.1 (Peoria L&D), in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[19] USACE, *Annual Report*, 1937, p. 976-977.
[20] USACE, *Annual Report*, 1939, p. 1220.
[21] Descriptions based on Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 439-480 and fieldwork done by the HAER recording team in 2007 and 2008.
[22] The Peoria Lock and Dam Historic District was listed in the National Register of Historic Places in 2004. The lock, dam, Maneuver Boat No. 2, and control station were determined to be contributing resources to the Peoria Lock and Dam Historic District, while the SANGAMON, new office building, and auxiliary shops were determined noncontributing. See Barbara J. Henning, "Peoria Lock and Dam Historic District," National Register of Historic Places Nomination Form, 2001.
[23] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 445.

through a constricted opening. Four valves operated by hydraulic machinery regulate the flow of water through the culverts.[24]

Centered on the landwall of the lock is the control station, a 3,500 square foot two-story building measuring 70' x 25' and 36' tall. It is identical to the one at La Grange and similar to three built by the Rock Island District on the Upper Mississippi River that date to 1934-36 (Lock and Dam Sites 13, 14, and 17). The concrete building with a flat roof has a facing of cream brick laid in stretcher bond. The symmetrical front and rear facades are divided into five bays by brick pilasters topped with cast stone caps. The second story windows are topped by fanlights while the first floor ones have been removed and the openings filled in due to the regular flooding and subsequent window breaking that occur at the site at least annually. Doors centered on both the front and rear facades feature concrete surrounds with Art Deco detailing. The interior space has been arranged to minimize flood damage. An exterior metal stairway on the downstream elevation accesses the second floor, necessary because of the propensity of the Illinois River to reach high water stage for long periods of time at this location.[25]

Structures associated with the operation of the lock include two tow haulage units installed in the 1970s and consisting of motorized winch assemblies that pull barges from the tow into or out of the lock. The units are located at each end of the lock's landwall. Their purpose is to let "parts of a fleet of barges to be locked through while not attached to their tow boat, thus making it possible to lock large modern units through without repeatedly detaching tow from the barges immediately in front of it."[26] Tow haulage units were originally added to not only Peoria, but also Lockport, Brandon Road, Dresden Island, Marseilles, and Starved Rock through a contract with the American Heist & Derrick Company in the 1930s. In September 1937, Capt. R. L. Dean, Assistant to the Division Engineer wrote to the District Engineer that he noticed how a lack of power tow-haulage units made "hand towing" necessary during double lockages. He advised: "in view of the tremendous increase in Illinois River traffic in recent years, with a corresponding increase in number of lockages which must also include an increase in double lockages, inquiry is made as to whether installation of power tow-haulage units at such locks as are now without them is not now economically justified."[27]

Two control stands (also called "dog houses") were built in the 1980s on the landward side of the lock chamber at the upstream and downstream ends. The 52

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[24] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 447-48; M.G. Barnes, "The Illinois Waterway," *Journal of the Western Society of Engineers* XXVI, no. 5 (May 1921): p. 180; L.D. Cornish and Walter M. Smith, "Engineering Features of the Illinois Waterway," *Journal of the Western Society of Engineers* 31, no. 5 (May 1926), pp. 178-82.

[25] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 95 and Volume 2, p. 449; Henning, "Peoria Lock and Dam Historic District," Section 7, p. 2.

[26] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 453-54.

[27] Letter dated September 11, 1937, located in Folder 821.13 (Locks-Machinery), in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

square foot, one room, one story metal buildings have flat roofs with overhanging eaves. Windows on all four walls provide unobstructed views of the lock chamber to the operator. The control stands protect the switches needed to operate the lock gates and valves. Due to the regular flooding at the site, the control stands sit on skids so they can be moved when necessary. The periodic flooding also affected the location of the operating machinery, which at other sites along the Illinois Waterway had been moved out of pits in the lock walls and located above ground. At Peoria and La Grange, however, the machinery was left in the lock walls.[28]

Maneuver Boat No. 2 is a 64.5' long x 30' wide work barge with a 3'-8" hull. A steam operated, permanently mounted gate-lifter on the boat is used to raise and lower the dam's Chanoine wicket gates.[29]

THE SANGAMON, in operation in 1972, is a 26' long x 12' wide, single-screw 380 horsepower push boat. The diesel engine is housed in a one-story cabin, on top of which sits the pilot house. THE SANGAMON pushes Maneuver Boat No. 2 into position along the dam since it not self-propelled. THE BEARDSTOWN at La Grange is almost identical to this boat.[30]

The 1996 survey undertaken by Mary Yeater Rathburn and American Resources Group Ltd. identified an area of development associated with the lock and dam on the access road leading to the lock and dam site. The utilitarian buildings were constructed at various times throughout the operational history of the site. Since the site regularly floods, with levels of 10' to 12' possible, the Corps constructed a new maintenance building on the site of the original 1939 lockkeeper's houses in 1986. The 2,160 square foot, one story brick building has a hip roof.[31] An original structure still in place is a 540 square foot, one story, two car frame garage clad in aluminum siding that dates to 1938.[32] The fire house shed dating to 1986 is near the garage. The one story, one room frame building is clad in aluminum siding and has a gable metal roof.[33] Other structures include the 1972 welding shop, housed in a 1,248 square foot building clad in metal siding with a shed roof.[34] The rectangular lumber shed is located across the road from the garage. It is a one story, one room frame building with a low pitched gable roof.[35] Finally, the 1970s era flammable liquid storage building next to the lumber shed is a one story, one room rectangular frame building clad in aluminum siding.[36]

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[28] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 457-460.
[29] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 451; Henning, "Peoria Lock and Dam Historic District," 2001, Section 7, pp. 1-2.
[30] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 455-56.
[31] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 467-68.
[32] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 471.
[33] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 473-74.
[34] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 475-76.
[35] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 477-78.
[36] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 479-80.

Located to the east of this area of development on the opposite side of Interstate 474 is the 1937 field office, which is the oldest building associated with the site. Used as the base of operations during the construction of the lock and dam, the field office is a 52 square foot one story, rectangular frame building that sits on concrete blocks and is clad in aluminum siding.[37]

B. Construction:

Contractor Great Lakes Dredge & Dock Company began work on the Peoria Lock and Dam on December 9, 1935. The company had 365 days to complete the work, putting the expected completion date at February 22, 1937. The number of workmen employed was expected to be as many as 559, with crews divided into three shifts so work could take place around the clock.[38]

In December and January 1935-36, workers cleared the site, built the field office, put down roadway fill, excavated from the lock area 300,600 cubic yards (cu yd) of earth (no rock had to be removed), and built the cofferdam. Workers used one hydraulic dredge (the 16' dredge OHIO), five crawler cranes, and one bulldozer for the excavation operation. An esplanade and access road were built by a subcontractor, Rocho Brothers. Work slowed in February due to severe weather and sub-zero temperatures, but some progress was made in grubbing, excavating, and setting and driving the steel sheet piling for the cofferdam cells. By March 1936, despite being slowed by high water, the headwalls were 75 percent complete. The Chicago Wood Piling Company of Chicago had started producing the wood piles. Work continued that month on setting and driving the steel sheet piling for the cofferdam cells, excavating, and setting the roadway fill. The following month, the dredge OHIO had nearly completed excavation for the cofferdam. The concrete headwalls for the 60" pipe culverts had been finished as well. High Point Lumber Company of High Point, Washington had started production of the crib timber for project subcontractor Marsh & Truman Lumber Company. Work slowed again in May and June 1936 due to problems with banks sloughing and the cofferdam, whose landwall had to be strengthened. The transformers were delayed as well, further pushing back the unwatering of the cofferdam. By July, unwatering was underway, although additional sump pumps had to be installed.[39]

Once excavation had been completed and the cofferdam built, the mixing plant construction and pile driving could begin. A total of 7,118 wood piles were driven, as well as Inland Steel Co. I-21 steel piles.[40] Construction materials arrived at the site

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[37] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 469-70.
[38] "Schedule for Peoria Lock," p. 1 in Folder 821.1 (Peoria L&D) in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[39] "Schedule for Peoria Lock," p. 2; Weekly progress reports from December 1935-May 1936 in Folder 821.1 (Peoria L&D) in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[40] "Final Cost Report, Peoria Lock-Illinois River Lock & Guide Walls," Under Contract No. ERW-1088-ENG-1 Cont'r: Great Lakes Dredge & Dock Co, December 1935-December 1937, U.S. Engineer Field Office, Peoria, IL, p. 9 in Folder 821.1 (Peoria L&D), in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

via barges. The cement was delivered directly to the site via closed barges. Fuller-Kenyon pumps pumped the cement directly into the Blaw-Knox mixer plant, which went into operation in August 1936. A crawler crane unloaded the aggregate, consisting of sand and gravel that was obtained from subcontractor Kingston Lake Gravel Company, from the barges and placed it into steel sheet pile bins with earth bottoms and open tops. A Whirley crane then moved the aggregate from these storage bins to the mixer plant as needed. The mixer plant was "composed of a set of bins of approximately 125 ton capacity, divided into four compartments for the various aggregates" and two rotary mixers with 1 cu yd capacity each.[41] Water was added to mix the cement and aggregate at a ratio of 29.25 gallons of water per cubic yard. The minimum amount of time for mixing a batch of concrete was 1 ½ minutes: "the mixer must revolve a minimum of 12 revolutions after all materials have been placed in it, and at a uniform speed."[42] The average output of the mixer was 45 cu yd an hour. Once the concrete had been mixed, it was put into 1 cu yd capacity buckets located on platform cars that were then hauled by gasoline locomotives to the site. A Whirley crane lifted the buckets off the platform cars and dumped the contents into wooden forms. For high forms, the concrete was poured into hoppers "and allowed to run through 'elephant-trunk' chutes into place." The empty buckets were then placed on the platform cars, which headed back to the plant. A flexible shaft, 1 ½ hp electric motor Mall Tool Company vibrator settled the concrete into the forms.[43] The average amount of concrete poured into wooden forms a day was 400 cu yd, at the most it was 530 cu yd. Concrete work was done in two shifts, each lasting eight hours.[44] Once crews had poured the concrete in "monoliths," workers prepared reports about each monolith poured that included the number of piles driven, the type of subsoil on which the monolith was poured, and the water and drainage conditions.[45] (See Appendix A, Figures 1 and 2)

The concrete work started on the lower guide wall, although wood driving operations at the site were slowed because of the mucky bottom. A sprinkling system was installed to cure the concrete and wood form production continued. The months of September and October 1936 saw a continuation of the concreting and pile driving work, but work slowed in November due to increasingly colder temperatures. Concrete work ceased for the season in December, although workers were still busy with other tasks in the winter months, including maintaining the cofferdam and pumps; driving "Z" piles, wood piles and steel sheeting in the lock walls and dam; and putting up the forms. In March 1937, workers were busy preparing the intermediate guide wall and placing the derrick stone in the stub of the dam. With spring's arrival, concrete work resumed.[46]

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[41] "Schedule for Peoria Lock," p. 2; "Final Cost Report," pp. 10-12; April 1936 Progress Report.
[42] "Schedule for Peoria Lock," p. 3.
[43] "Schedule for Peoria Lock," p. 4.
[44] "Schedule for Peoria Lock," p. 3; "Final Cost Report," pp. 10-12.
[45] Foundation Reports in Folder 821.1 (Peoria L&D) in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[46] August 1936 through April 1937 Progress Reports.

In May 1937, the steel for the upper gates, valves, stop logs and emergency dam arrived at the site. A. H. Knudson and Company painted all the metalwork. By July 30, the concrete had all been poured. Strobel Construction Company started working on the valve and gate machinery recesses and building stop log roller plate forms as well as the land leaf of the upper gate. Peoria Piping and Equipment Company began running pipe to the top of the land wall. By September, Strobel had completed the gates and operating machinery for all four of the valves and lined and set the remainder of the machinery. October and November 1937 were devoted to finishing up the remaining components, such as constructing the upper guide wall, backfilling, completing the roadway fill, dredging, and removing the remaining materials and equipment. On December 2, 1937, the contract had been completed.[47]

Other components of the construction site included repair/blacksmith and carpenter shops, which were located outside the cofferdam about 500' from the construction area. These were temporary structures measuring 16' x 32' where a crew of one blacksmith and three pipefitters worked. Fuel was stored in one of two 10,000 gallon tanks located in the cofferdam. There was also a 16' x 32' storehouse manned by one man per shift. A power line equipped with 13,200 volt lines located about 1,400' east of the lock supplied electricity to the site. There were also three barracks on site for the workers; two served as offices and one served as a canteen where meals could be purchased. The one story barracks measured 26' x 48'.[48]

The Army Corps had complaints about Great Lakes Dredge & Dock Company's work. The job was supposed to be finished by December 1936 but was delayed almost an entire year because of weather, high water, and numerous change work orders. Issues detailed in the final report on construction issued by the Engineer Field Office in Peoria included springs breaking through the unwatered excavated areas and the inadequate removal of water from construction areas. The Army Corps also thought the contractor had made poor decisions, such as their decision to use an earth dike rather than steel sheet piling near the cofferdam. They also criticized the concrete work, noting that at times the poured concrete was inefficiently heated and not sufficiently protected from the elements.[49]

Work at the site was further hampered by labor disputes. The field office reported that originally the contractor planned on using relief and union labor, "paying the minimum rates set forth in the specifications." A union demonstration caused the contractor to increase rates to bring them in line with the "union wage rates prevailing in the vicinity being used." The contractor originally agreed to hire 80 percent of the workers from Peoria, Illinois and 20 percent from Pekin, Illinois, using the United States Employment Office in Peoria with "preference being given to union men who were on relief." The contractor claimed it was difficult to find men fitting these

[47] May through December 1937 Progress Reports.
[48] "Schedule for Peoria Lock," pp. 4-5.
[49] "Final Cost Report," pp. 2-3.

requirements with enough experience and did not fulfill the agreement.[50] Despite the various delays and problems, the Peoria Lock and Dam opened for use in 1939.

C. Operation:

The dam's Chanoine wicket gates had to be manually operated. The gates consist of a row of wooden shutters (also called leaves). Each wooden shutter is supported by a framework known as a "horse" that contacts the back of each shutter at nearly the center point. The horse creates a horizontal axis of support that keeps the shutter up at a slight angle. The part of the shutter above the axis is known as the "head" or "chase" while the part below is known as the "breech" or "butt." The horse and shutter are kept upright by a long prop that extends at approximately a 45 degree angle from the bank of the shutter to the hurter, a structural framework located on the dam's floor.[51] On the Illinois Waterway, the Chanoine wicket gates were kept lowered during extended periods of high water. If necessary, the wickets were raised by personnel on maneuver boats. The process of lowering the gates involved dislocating the prop end, which then caused the pressure exerted by the water to push the shutter down on top of the hurter, prop and horse. To raise the wickets, the shutters were lifted so the prop fell in place.[52] Rathburn describes the process at Peoria Dam:

> Positioning the port side of *Maneuver Boat No. 2* against the upstream side of the dam, the crew attaches a metal hook to the underwater gate by hand and then connects the other end of the hook, its eye, to the steam-operated gate lifter crane permanently mounted on the boat. The gate-lifter operator then pulls the gate up into the vertical position. A diagonal prop, braced out from the wicket on the upstream side by a 'horse,' holds the gate in place. Once this is done, a winch, called the return engine, pulls the boat into position to lift the next wicket in line….The same procedure used for raising the dam is used in reverse for lowering it when the water levels rise sufficiently.[53]

During those periods when the wicket gates were raised, the lock had to be put into operation for barges using the waterway. The process of locking through barges at the downstream end of the lock heading upstream involves closing the upstream gates and opening the downstream ones. The barges are then moved into the chamber and downstream gates closed. Intakes located just outside the upstream miter gates draw water into the culverts within the chamber walls, which then flows through the culverts and out the ports into the chamber. This incoming water raises the barges up to the level of the upper pool. The upper gates are then opened, and the barges are

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[50] "Final Cost Report," p. 3.
[51] Detailed descriptions of Chanoine wicket dams are available in Thomas and Wyatt, pp. 227-232 and Wegmann, pp. 327-331.
[52] See Wegmann, p. 330, and Thomas and Wyatt, p. 231.
[53] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, pp. 91-92.

maneuvered out of the lock and into the upper pool. The operation is reversed for barges heading downstream.[54]

As originally designed, the Illinois Waterway had been designed for use by "towboats pushing eight jumbo hopper barges." The jumbo barges each measured 35' x 195'. The configuration of the eight barge tow with a towboat consisted of two rows of three barges tied together followed by a row of two barges tied together. The towboat pushed the three rows into position in the lock chamber, then moved alongside the first row (made up of two barges) during the lockage. The resulting configuration measured 105' x 600', which allowed all the barges to be locked through in one pass since the lock chamber conformed to the Ohio River Standard of 110' x 600'. By the 1950s, the fourteen barge tow had become the standard. While the Thomas J. O'Brien Lock with its 110' x 1000' chamber could handle this larger tow configuration, the earlier locks could not. The fourteen barge tow measured 105' x 985', requiring that the tow be broken into two, known as "cuts," on the other locks. The first cut was made up of two rows of three barges tied together. The second cut followed the standard configuration used in the eight barge tow. Rathburn describes the locking through process with the fourteen barge tow configuration.

> After breaking the two into these two cuts, the towboat pushed the first cut of barges through the lock, locked through with it, pushed the cut out of the lock, locked back through to get the second cut of barges, pushed it into the lock, moved over into the 'third barge slot' in the last row of the eight-barge configuration, locked through with the second cut, and then reassembled the two cuts into one united configuration and moved back into its pushing position.[55]

This process was time consuming and caused congestion along the waterway, so the Army Corps installed tow haulage units in the 1970s at all the locks except Thomas J. O'Brien. These units allowed the first cut to be pulled through the lock without the towboat, which remained in its position in the second cut. This minimized some of the time spent locking through. The installation of the tow haulage units facilitated the use of seventeen barge tow configurations, measuring 105' x 1118'. In this configuration, the first cut is made up three rows of three barges. The second cut has two rows of three barges while the last row has two barges and an open slot for the towboat.[56]

From the 1930s to the 1970s, the amount and size of the vessels using the Illinois Waterway increased. In 1934, commercial traffic on the waterway amounted to 104,750, which increased by 1953 to 20 million.[57] Traffic on the waterway leveled in

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[54] See Thomas and Wyatt, *Improvement of Rivers*, p. 147.
[55] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 99.
[56] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, pp. 100-102.
[57] Department of Public Works & Buildings, "132 Years of Public Service: The History and Duties of the Division of Waterways," (State of Illinois, 1955), p. 15.

the 1970s but congestion on both the Illinois Waterway and the Upper Mississippi River continues. According to a recently released study of the two systems dating to 2005, 51.6 million tons of commercial cargo worth $9.5 billion was transported on the Illinois Waterway. Together the two systems move 60 percent of corn exports and 45 percent of soybean exports, in addition to coal, chemicals and petroleum.[58]

Peoria Lock and Dam site is significant for its extant wicket gates, which are a rare surviving example. As noted in the 1996 inventory of the waterway, the only other surviving Corps facilities are at La Grange and two sites on the Ohio River. From 1878 to the 1930s, "wicket dams…were the only kind of bank to bank structures the Corps built."[59] In order to raise and lower the wicket gates, the Corps had Maneuver Boat No. 2 built specifically for the site. Its original design was almost identical to that of Maneuver Boat No. 1 built for use at La Grange Lock and Dam. The maneuver boats are also significant as some of the last examples of the type.[60]

Illinois Waterway traffic statistics are provided in the U.S. Army Corps of Engineers' Annual Reports. The information is presented in various ways throughout the 1930s. In 1931, the upbound traffic on the Illinois River (from La Salle to Grafton, IL) consisted of 128 steamers, 609 motor vessels, 21 sailing vessels, and 457 barges for a total of 1,215 vessels. The downbound traffic included 140 steamers, 515 motor vessels, 21 sailing vessels, and 400 barges for a total of 1,076 vessels. (USACE, *Annual Report*, Part II, 1932, p. 696.) By 1933, traffic had increased to a total of 2,140 upbound vessels at 341,760 tons, consisting of 50 steamers, 1,251 motor vessels, 772 barges, and 67 other types. Downbound traffic numbered 2,290 vessels at 344,249 tons, including 50 steamers, 1,282 motor vessels, 756 barges, and 202 other types. In 1934, the total numbers of vessels had declined but the tonnages increased, with upbound tonnage at 642,715 and downbound at 682,214. (USACE, *Annual Report*, Part II, 1934, p. 670 and Part II, 1935, p. 710.) In 1935, the statistics for the Illinois Waterway also included the Chicago Sanitary & Ship Canal and the Calumet-Sag Canal. The total tonnage was 1,361,280. On the South Branch of the Chicago River, 215,107 tons were carried. Total tonnage, including rafted traffic, was 1,584,428 tons worth $48,710,394. (USACE, *Annual Report*, Part II, 1936, p. 747.) In 1936, 1,537,759 tons were transported on the Illinois Waterway and 507,805 tons were moved on the South Branch of the Chicago River. The total tonnage was 2,048,057, including rafted traffic, for a total value of $54,725,585. (USACE, *Annual Report*, Part II, 1937, p. 781.) In 1937, 2,874,864 tons were transported on the Illinois Waterway and 698,329 tons on the South Branch of the Chicago River. The total tonnage, plus rafted traffic, equaled 3,575,299 tons worth $65,604,398. (USACE, *Annual Report*, Part II, 1938, p. 803.) By 1938, the total tonnage on the Illinois Waterway (which included the Chicago Sanitary & Ship Canal, Calumet-Sag Canal, and South Branch of the Chicago River) was 4,446,493, including rafted traffic, at a total worth of $109,008,794. (USACE, *Annual Report*, Part II, 1939, p. 863). From 1975-86, the amount of goods shipped on the waterway decreased from 48.5 million to 42.3 million. (Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," p. 103).

[58] See Final Draft, "Re-Evaluation of the Recommended Plan: UMR-IWW System Navigation Study, Interim Report," issued March 2008, available at http://www2.mvr.usace.army.mil/UMRS/NESP/ (accessed March 2009).

[59] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 503.

[60] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 505.

Part III. Sources of Information

A. Primary Sources

Army Corps of Engineers, Chicago District, Record Group 77, National Archives and Records Administration, Great Lakes Region (Chicago).

U.S. Army Corps of Engineers. *Annual Report of the Chief of Engineers, U.S. Army.* Washington: Government Printing Office, 1937-39.

B. Secondary Sources

Henning, Barbara J. "Peoria Lock and Dam Historic District." National Register of Historic Places Nomination Form, 2001.

Rathburn, Mary Yeater, American Resources Group, Ltd. "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange." Volume 1. Prepared for the U.S. Army Corps of Engineers, Rock Island District, Rock Island, Illinois. October 1996.

_____. "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange." Volume 2. Prepared for the U.S. Army Corps of Engineers, Rock Island District, Rock Island, Illinois. October 1996.

Thomas, B.F. and D.A. Wyatt. *The Improvement of Rivers: A Treatise on the Methods Employed for Improving Streams for Open Navigation, and for Navigation by Means of Locks and Dams*. New York: John Wiley & Sons, 1905.

Wegmann, Edward. *The Design and Construction of Dams Including Masonry Earth, Rock-Fill, Timber and Steel Structures. Also the Principle Types of Moving Dams*. New York: John Wiley & Sons, 1922.

C. Likely Sources Not Yet Investigated

Research was conducted in the Army Corps of Engineers records (Record Group 77) at the National Archives and Records Administration, Great Lakes Region, Chicago, but time constraints prevented thorough research of all records. Additional information may be available.

Appendix A: Images

Figure 1: Caption reads: "General view of pump set-up while placing Monolith 37-L. Looking downstream and inshore," October 10, 1936. From Foundation Reports, 1936, Great Lakes Dredge & Dock Company, in Folder 821.1 (Peoria L&D) Contract W-1088-Eng-1, Record Group 77, National Archives and Records Administration, Great Lakes Region-Chicago.

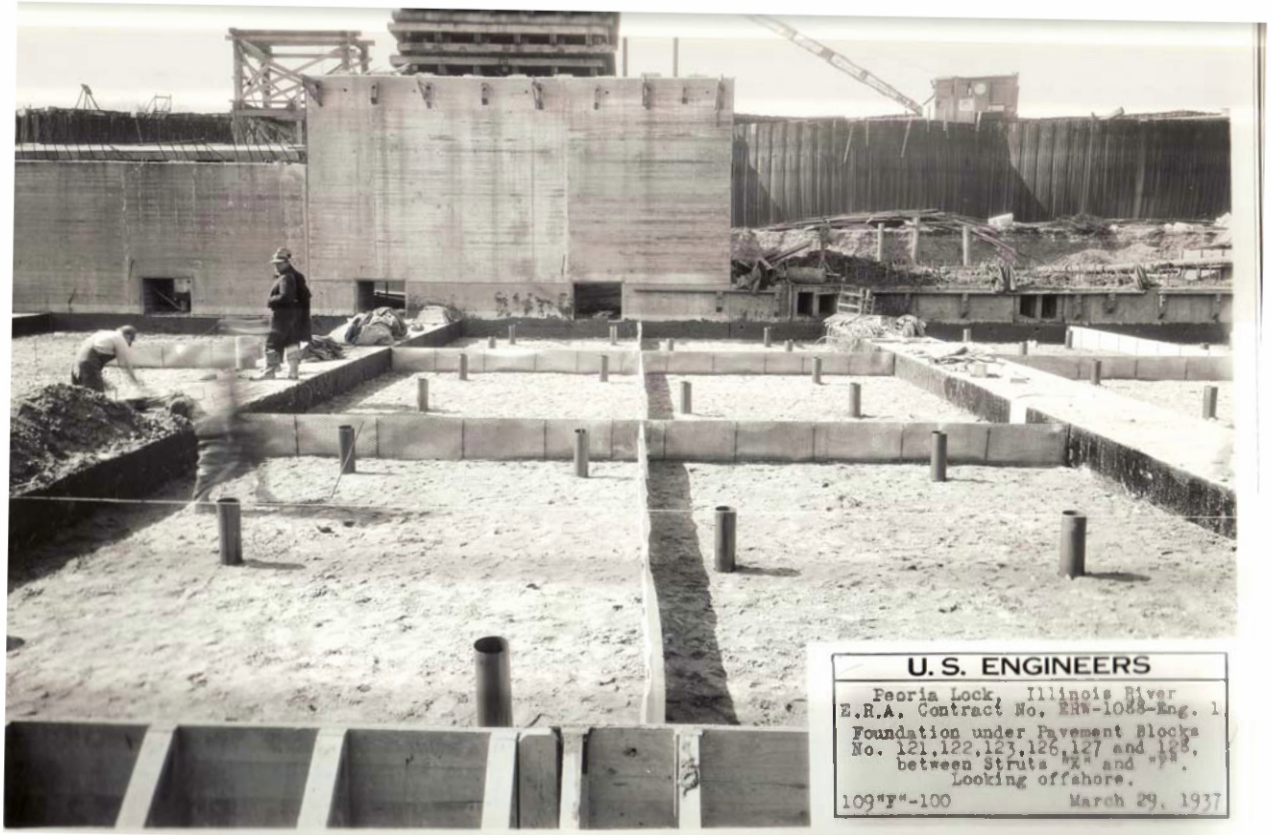

Figure 2: Caption reads: "Foundation under pavement blocks No. 121, 122, 123, 126, 127 and 128 between struts "E" and "F". Looking offshore," March 29, 1937. From Foundation Reports, 1937, Great Lakes Dock & Dredge Company, in Folder 821.1 (Peoria L&D) Contract ERW-1088-Eng-1, Record Group 77, National Archives and Records Administration, Great Lakes Region-Chicago.